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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,905	11/06/2006	Makiko Kitazoe	029567-00010	5377
4372	7590	09/16/2011	EXAMINER	
ARENT FOX LLP 1050 CONNECTICUT AVENUE, N.W. SUITE 400 WASHINGTON, DC 20036			CHEN, KEATH T	
			ART UNIT	PAPER NUMBER
			1716	
			NOTIFICATION DATE	DELIVERY MODE
			09/16/2011	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DCIPDocket@arentfox.com  
IPMatters@arentfox.com  
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# Office Action Summary

## Application No.

10/591,905

## Applicant(s)

KITAZOE ET AL.

## Examiner

KEATH CHEN

## Art Unit

1716

**Period for Reply**  
-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 August 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 5) ☒ Claim(s) 1-3, 6-18 and 20 is/are pending in the application.
- 5a) Of the above claim(s) 10-18 is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1-3, 6-9 and 20 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-800)  
Paper No(s)/Mail Date \_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's amendment, filed on 08/31/2011, in response to the rejection of claims 1-3, 6-9, and 19-20 in the non-final office action, mailed on 06/03/2011, by amending claim 1 and cancelling claim 19 is entered and will be discussed below.

### ***Election/Restrictions***

1. Claims 10-18 remain withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention II, there being no allowable generic or linking claim.

### ***Claim interpretation***

The newly added limitations a constant-voltage bias voltage power supply connected to the heating power supply circuitry to apply a bias voltage "across two terminals of the heating power supply circuitry". Fig. 1 of instant Application clearly shows the constant voltage power supply connected at an un-specified point in the power feed circuit, not across the two terminals 6a and 6b. Furthermore, the ground of the constant voltage power supply is not connected to either terminal 6a or 6b.

However, the Specification also described the change of voltage across the terminals as a result of the applied voltage from the constant voltage power supply 8 (see PGPub [0087] and [0090], for example). Therefore, the "across two terminals of the heating power supply circuitry" is considered a result of applying bias voltage at any point of the circuit (that intrinsically affecting the voltage across the terminals of the circuit).

If Applicants argue that the bias power has to be connected across the two terminals, it would have been a 35 USC 112 1<sup>st</sup> paragraph new matter issue.

The "means for changing the polarity of the bias voltage" of claim 1 will be treated as 35 USC 112 6<sup>th</sup> paragraph. This is treated as the changeover switch 8a. See MPEP 2181 I.

The portion "based on a kind of the cleaning gas" will not be treated as 35 USC 112 6<sup>th</sup> paragraph because there is no **structure** described in the Specification related to this limitation. The Specification only describes "The polarity of a bias voltage to be applied is set ... can be appropriately changed depending on the kind of an inert gas and a reducing gas which are introduced" which includes turn the changeover switch manually. There is no description of automatic detection of the kind of the cleaning gas, sending the detection signal to the controller 10, turn the changeover switch based on the detected gas signal (see page 14 line 11 to page 15, line 3).

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35 U.S. Code not included in this action can be found in a prior Office action.

**2. Claims 1-3, 6-9 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibashi (US 6375756, hereafter '756), in view of Sawayama et al. (US 20030164225, hereafter '225), Dowling (US 6562201, hereafter '201), Harris et al. (US 4781803, hereafter '803), and Reale (US 5451754, hereafter '754).**

'756 teaches some limitations:

Claim 1: a film forming apparatus employing a hot element CVD with in situ cleaning (Fig. 1, col. 4, lines 44-46) utilizing the catalytic reaction of a hot element in decomposition or activation process of the material gas is referred to as a Catalytic-CVD (col. 1, lines 39-42, the claimed "a self-cleaning catalytic chemical vapor deposition apparatus for forming a thin film"):

a processing vacuum chamber 1 (col. 4, line 60, the claimed "a reaction chamber") a hot element 3 is installed (col. 4, lines 66-67, the claimed "comprising a catalytic body"),

an energy supply mechanism 30 (col. 5, line 12, the claimed "a heating power supply circuitry connected to the catalytic body"),

a gas supply vessel 2 connected with gas supply system (col. 4, lines 65-66), gas supplying systems 23,25 for supplying ... a cleaning gas (col. 4, lines 61-63, the claimed "a gas-supply port through which a cleaning gas in introduced in the reaction chamber", however, cleaning gas is an intended use),

Applicant's claimed requirements "a cleaning gas" and "based on a kind of the cleaning gas" are considered intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure

is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

'756 does not teach the other limitations of

Claim 1: (1A) a constant-current (heating power supply ...),

(1B) a constant-voltage bias voltage power supply connected to the heating power supply circuitry to apply a bias voltage across two terminals of the heating power supply circuitry,

(1C) means for changing the polarity of the bias voltage applied across the two terminals of the heating power supply circuitry based on a kind of the cleaning gas.

Claim 9: a monitoring device which detects the occurrence of etching of the catalytic body itself on the basis of electric resistance of the catalytic body.

'756 further teaches that by setting a hot element at a high temperature above 2000° C., it becomes possible to suppress the corrosion of the hot element due to the reaction with a cleaning gas to the practical use level (col. 3, lines 55-58), if the cleaning gas is introduced before hot element 3 is heated to 2000° C., the hot element is made to react with the cleaning gas until heated up to 2000° C. which causes corrosion (col. 6, lines 22-25). Therefore, operation at below 2000° C, corrosion of the hot wire is a concern.

'225 is an analogous art in the field of catalytic CVD ([0175], see also [0005], hot-wire CVD). '225 teaches preferably controlling a predetermined current density to be constant to the power supply, so that the chemical reaction is stabilized and the service life of the heat generating member is extended ([0045]). '225 also teaches a current sensor ([0315], 5<sup>th</sup> sentence).

At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to adopted a constant current power supply, as taught by '225, to the energy supply mechanism 30 of '756 (the limitation of 1A) by using a current sensor (the limitations of claim 9), for the purpose of stabilizing the chemical reaction and extending the service life of the heat generating member, as taught by '225 ([0045]).

'201 is an analogous art in the field of controlling corrosion (title) of metallic structure (col. 1, line 20) and useable for the semiconductor system (col. 4, line 6). '201 teaches cathodic protection (col. 1, line 36, see also lines 51-64) cathodic protection prevents corrosion by introducing an electrical current from external sources to counteract the normal electrical chemical corrosion reactions whereas coatings form a barrier to prevent the flow of corrosion current or electrons between the naturally occurring anodes and cathodes (col. 1, lines 38-44). Therefore, **a person of ordinary skill in the art would have known the cathode bias would counteract, in addition**

**to the naturally occurring anodes and cathodes, to hot wire (forced current between anodes and cathodes).**

'803 is an analogous art in the field of corrosion resistance of metal (col. 1, lines 23-27). '803 teaches that corrosion resistance during anodic bias at certain species (col. 4, lines 33-37).

'754 is an analogous art in the field of controlling charge of substrate (abstract) particularly in sputtering metal film (col. 3, lines 52-53). '754 teaches a changeover switch which change polarity of the bias voltage, including ground, applied to the shield (col. 4, lines 30-39) to control the charge deposited on the substrate (#14). Note the DC source 23 and 27 has the same symbol as Applicants' power sources 8 in Fig. 1, a constant voltage source.

At the time the invention was made, it would have been obvious to a person having ordinary skill in the art to have combined '201, '803, and '754 with '756 and 225. Specifically, to have applied either a cathodic or anodic bias voltage, as taught by '201 and '803, respectively, to the hot element 3 in the apparatus of '756, and furthermore to have adopted the bias voltage switch with constant voltage supplies (the limitations of 1B and 1C) as taught in Fig. 1 of '754 to switch the polarity as needed for switching the polarity for '201 and '803, for the purpose of inhibiting corrosion as taught in '756 (col. 6,



lines 19-26) and '201 (col. 1, line 36) and '803 (col. 4, lines 33-37) and to provide polarity switch capability as taught by '868 (col. 8, lines 37-40 and col. 9, lines 21-26).

Note the limitations "based on a kind of the cleaning gas" is an intended use. The combined apparatus is capable of this operation, for example, by operator **manually** change the switch depending on the feeding gas.

'756 further teaches the limitations of:

Claim 2: a conventional plasma cleaning may be simultaneously carried out in the method of this invention, by installing an electrode for the plasma generation in processing vacuum chamber 1 (col. 7, lines 45-48, the claimed "a radical species generator which decomposes the cleaning gas into a radical species and introduces the radical species into the reaction chamber").

The apparatus of the above combination would have the capability of supplying various gases and setting polarity according to the gases species of the claim limitations of claims 3, 6-8 and 20 (see intended use discussion above).

### ***Response to Arguments***

Applicant's arguments filed 08/31/2011 have been fully considered but they are not persuasive.

3. In regarding to claim interpretation, Applicants argue that "based on a kind of the cleaning gas" should be interpreted as 35 USC 112 6th paragraph because this function can be manually operated, see the bridging paragraph between pages 7 and 8.

This argument is found not persuasive.

The examiner maintains "based on a kind of the cleaning gas" as there is no structure limitation related to this operation. Applicants' admission that this is a manual operation further evidenced that there is no structure related to this function. The manual operation to achieve this limitation was set forth in the previous office action (bottom of page 7).

4. In regarding to 35 USC 35 103(a) rejection of claims 1-3, 6-9, and 19-20 based on '756, '225, Dowling '201, Harris '803, and '754, Applicants argue that neither '201 nor '803 disclose providing a bias voltage power across a heating power source, see the first complete paragraph of page 9.

This argument is found not persuasive.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

'201 teaches cathodic protection (col. 1, line 36, see also lines 51-64) cathodic protection prevents corrosion by introducing an electrical current from external sources to counteract the normal electrical chemical corrosion reactions whereas coatings form

a barrier to prevent the flow of corrosion current or electrons between the naturally occurring anodes and cathodes (col. 1, lines 38-44). Therefore, **a person of ordinary skill in the art would have known the cathode bias would counteract, in addition to the naturally occurring anodes and cathodes, to hot wire (forced current between anodes and cathodes).**

'756 teaches the corrosion at below 2000 C operating temperature. '201 teaches that by applying a cathodic protection to counteract the current flow in a corrosion environment. Therefore, by connection the cathodic protection to any point of the hot wire 3 and energy supply mechanism 30 of '756, an effect of change the voltage at two terminals is achieved, as described in Applicants specification ([0087] and [0090]). See Claim interpretation above.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEATH CHEN whose telephone number is (571)270-1870. The examiner can normally be reached on 6:30AM-3 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KEATH T CHEN/  
Primary Examiner, Art Unit 1716

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